APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,271	08/27/2003	Joseph Grayson Minton JR.	106102-00-01	7271

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EXAMINER
DAY, HERNG DER

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- · Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 August 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-19</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-19</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 August 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All   b)☐ Some * c)☐ None of:

　　　　1.☐ Certified copies of the priority documents have been received.

　　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/25/03</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-19 have been examined and rejected.

Drawings

2.   The drawings are objected to for the following reasons. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the Examiner, the Applicants will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2-1.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

        (a) a check is performed at 7130, as described in line 9 of page 20.

        (b) a flag is raised at 7140, as described in lines 10-11 of page 20.

2-2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

        (a) 2130, as shown in FIG. 2.

Specification

3.   The disclosure is objected to because of the following informalities. Appropriate

correction is required.

3-1.   It appears that "at effort to determine flow direction", as described in line 5 of paragraph

[0005], should be "an effort to determine flow direction".

3-2.   It appears that "illustrated in FIG. 5", as described in line 22 of paragraph [0029], should

be "illustrated in FIG. 8".

3-3.   It appears that "use of the use of the method", as described in line 12 of paragraph

[0039], should be "use of the method".

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

5.   Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

5-1.   Claim 1 recites the limitations "the D8 method", "the maximum depth depression", "the

largest depression area", and "the largest flat area" in the preamble of the claim. There is

insufficient antecedent basis for each of the limitation in the claim.

5-2.   Claim 2 recites the limitation "assigning a flow vector of between one and nine to the

minor cell" in line 7 of the claim. It does not appear to have support in the specification. As

described in paragraph [0028], "The number assigned to each cell in the array signifies either a

flow direction (in the case of numbers "1" to "8"), as shown in FIG. 5, or that the minor cell is a

problem cell (in the cast of a "0")."

5-3.   Claim 3 recites the limitations "the center cell" in lines 10 and 12 of the claim. There is

insufficient antecedent basis for this limitation in the claim.

5-4.   Claim 4 recites the limitations, "the largest depression area", "the maximum depth

depression", and "the D8 method" in the preamble of the claim. There is insufficient antecedent

basis for each of the limitation in the claim.

5-5.   Claim 14 recites the limitation "the D8 method" in the preamble of the claim. There is

insufficient antecedent basis for this limitation in the claim.

5-6.   Claim 14 recites the limitation "randomizing a best path selection, if there are no

potential paths remaining or if there are multiple potential paths remaining" in lines 29-30 of the

claim. It is unclear how to randomize a best path selection, if there are no potential paths

remaining.

5-7.   Claims not specifically rejected above are rejected as being dependent on a rejected

claim.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

7.   Claims 1-19 are rejected under 35 U.S.C. 101 because the inventions as disclosed in

claims are directed to non-statutory subject matter.

7-1.   Regarding claims 1-19, it appears to be directed to the manipulation of abstract ideas of generating flow vectors without resulting in a practical application producing a concrete, useful, and tangible result. For example, as shown in FIG. 7, unfixable conditions do exist for fixing depressions. Furthermore, there are other conditions with the recited step of "exiting the method" without showing any concrete, useful, and tangible result has been produced in a practical application.

7-2.   The Examiner acknowledges that even though the claims are presently considered non-statutory they are additionally rejected below over the prior art. The Examiner assumes the Applicants will amend the claims to overcome the 101 rejections and thus make the claims statutory.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Garbrecht et al., "The Assignment of Drainage Direction over Flat Surfaces in Raster Digital Elevation Models", Journal of Hydrology, June 1997, pages 204-213, (IDS 6 filed September 25, 2003).

9-1.   Regarding claim 1, Garbrecht et al. disclose a method for generating flow vectors based in part on the D8 method for all or part of a watershed divided into [at least] one predefined, rectangular major cell encompassing at least nine predefined, rectangular minor cells including a

center minor cell and eight neighbor minor cells wherein the watershed includes one [or more]

problem areas identified as [depressions,] flat areas [or peaks] each of which extends across one

[or more] major cells and each of which requires fixing and wherein further the number, location

and elevation of all minor cells are known as are the maximum depth depression to be corrected,

the maximum number of downstream minor cells to check in fixing depressions and peaks, the

largest depression area to fix and the largest flat area to fix, comprising:

if flow vectors for minor cells within more than one major cell are desired, designating

one major cell for which to begin generating flow vectors (page 207, Fig. 1(a) as a major cell);

creating a buffered array containing elevation and identification data for all minor cells in

the designated major cell and all major cells, if any, bordering the designated major cell (page

207, Fig. 1(a), upper-right values represent cell elevation);

calculating flow vector values for each minor cell within the buffered array using the D8

method wherein a flow vector value of zero is assigned to any minor cell located in a problem

area for which a flow vector value cannot be calculated using the D8 method (page 207, Fig.

1(a)-(d) shows elevation incrementation);

storing the calculated flow vector values in association with the minor cell to which they

relate (page 207, Fig. 1(d) shows flow direction);

checking the flow vector value of each minor cell within the designated major cell until

all cells have been checked and all cells having a flow vector value of zero have been found

(page 207, Fig. 1(d) shows flow direction);

assigning a problem type to each minor cell having a flow vector value of zero (a flat

surface of 25 cells, page 206, section 3, paragraph 1);

[fixing first all minor cells in the designated major cell to which a depression problem type has been assigned wherein depressions are fixed independently and successively from the highest depression to the lowest depression and elevation changes are imposed on minor cells, as required;]

fixing second all minor cells in the designated major cell to which a flat area problem type has been assigned wherein each flat area is fixed independently and elevation changes are imposed on minor cells, as required (page 207, Fig. 1(a)-(d) shows elevation incrementation);

[fixing third all minor cells in the designated major cell to which a peak problem type has been assigned wherein peaks are fixed independently and successively from the lowest peak to the highest peak and elevation changes are imposed on minor cells, as required;]

recalculating flow vector values for each minor cell within the buffered array using the D8 method wherein a flow vector value of zero is assigned to any minor cell located in a problem area for which a flow vector cannot be calculated using the D8 method (page 207, Fig. 1(a)-(d) shows elevation incrementation)

checking again the flow vector value of each minor cell within the designated major cell until all cells have been checked and all cells having a flow vector value of zero, if any, are found;

if any minor cells having a flow vector value of zero have been found,

[fixing first all minor cells in the designated major cell to which a depression problem type has been assigned wherein depressions are fixed independently and successively from the highest depression to the lowest depression by imposing elevation changes on minor cells, as required;]

fixing second all minor cells in the designated major cell to which a flat area

problem type has been assigned wherein each flat area is fixed independently by imposing

elevation changes on minor cells, as required (page 207, Fig. 1(a)-(d) shows elevation

incrementation);

[fixing third all minor cells in the designated major cell to which a peak problem

type has been assigned wherein peaks are fixed independently and successively from the lowest

peak to the highest peak and elevation changes are imposed on minor cells, as required;]

storing the elevation and flow vector data associated with each minor cell as changed, if

necessary (page 207, Fig. 1(d) shows flow direction); and

if there are unselected major cells remaining, selecting another major cell and returning to

the creating a buffered array step (a watershed divided into one predefined, rectangular major

cell).

9-2.   Regarding claims 2 and 3, Garbrecht et al. disclose a new algorithm that modifies flat

surface with a D-8 flow-routing approach (page 205, paragraph 4). Therefore, assign flow vector

values and problem types are anticipated using D-8 approach with only one major cell.

Applicant also admit in paragraph [0036] the routine for making corrections for flat areas is

derived largely from the published work of Garbrecht et al.

10.   Claims 4-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Martz et al., "An

Outlet Breaching Algorithm for the Treatment of Closed Depressions in a Raster DEM",

Computers & Geosciences, August 1999, pages 835-844, (IDS 8 filed September 25, 2003).

10-1.   Regarding claims 4-13, Martz et al. disclose a method for generating flow vectors for all

or part of a watershed divided into [at least] one predefined, rectangular major cell encompassing

at least nine predefined, rectangular minor cells including a center minor cell and eight neighbor minor cells, wherein the watershed includes one or more problem areas identified as depressions requiring flow vector correction of minor cells therein, each of which extends across one or more major cells, wherein the number, location and elevation of all minor cells are known as are the largest depression area to be corrected, the maximum number of times the maximum depth depression may be modified in an attempt to fix any individual depression and the maximum number of downstream cells permitted to be checked to find a good outlet and wherein further a buffered array containing elevation and identification data for all minor cells in a designated major cell and in all major cells, if any, bordering the designated major cell has been established and flow vector values for all minor cells in the buffered array have been calculated to the extent possible based on the D8 method and any minor cell located in a depression has been assigned a zero flow vector value. All steps are anticipated by Martz et al. as shown in Fig. 2 by TOPAZ outlet breaching algorithm because there is only one major cell as recited in the preamble.

Conclusion

11.   Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the

organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day
August 7, 2006

Thai Phan
Patent Examiner AU: 2128